Effective Date 5-8-92

TITLE: TAPE EXTENSOMETER AND EXTENSION ROD CALIBRATION CHECK AND USE

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MOC Manager of Safety and Plant Protection Concurrence: H.R. Date: 5-5-92

SNL QA Approval: Jessica L Rojo Date: 5-5-92

PURPOSE: This document will detail the procedure for operation of the Tape Extensometer.

RESPONSIBILITY: It is the responsibility of the person(s) performing this procedure to be familiar with this procedure and references. They are also responsible for assuring that fixtures and measurement devices used are certified or in calibration and working properly.

SAFETY: All work will be done in accordance with the WIPP Safety Manual and any applicable Safe Operating Procedures. Other safety requirements may be specified in a safe work permit. The following safety concerns will also apply:

1. Access to the underground will be in accordance with existing WIPP Site policies.

2. Ground control in the work area will be performed prior to the start of work.

3. Review and follow any applicable MSDS sheets prior to performing this procedure.

4. If this procedure will be performed in a Heated Room and/or Confined Space, it will be conducted under the guidelines specified for the Heated Room and/or Confined Space Entry procedures, relevant SOP's, and Confined Space training (if applicable). Access requirements for visitors and workers are also specified in those documents. Heated Room and/or Confined Space qualifications will be required for individuals that are working. Use caution in working with tools and hardware in heated rooms, since these items and the formation may become hot enough to cause burns, when contacted.

REFERENCES:

I. Sinco Tape Extensometer, Model 518115 E/M Instruction Manual. Slope Indicator Co., 3668 Albion Pl. N., Seattle, WA 98103.

II. WID WIPP "Confined Space Entry Procedure", WP12-110 (latest revision)

III. WID WIPP "Procedure for Heated Room Entry", WP12-103 (latest revision)

FORMS:

I. Tape Extensometer Calibration Data; No. 48 (latest revision)

II. Manual Reading Gage Data; No. 31 (latest revision)

III. Mining Sequence Closure Gage Data; No. 35 (latest revision)

IV. Manual Gage Reading Frequency; No. 43 (latest revision)

V. Tape Extensometer Extension Rod Calibration Check Data; No. 185 (latest revision)

PROCEDURE:

INTRODUCTION
The tape extensometer is a portable precision instrument that is used to measure distances between points. Typically it is used to measure distances between mining sequence, temporary manual closure, permanent manual closure and other manually read closure points.

I. Tape Extensometer Calibration Check (form 48)

A. Introduction and Preparation

1. Tape extensometers will be calibration checked before starting a set of measurements, when repaired or whenever instrument damage is suspected. Normally the calibration check will occur prior to starting a group of measurements (which may require more than one shift to complete). If the measurements are not continued during the next working shift, the calibration check must be repeated. The PI or PI designee will provide direction if additional calibration checks (before and after measurements or once per shift, etc.) are required.

   NOTE: Retain all calibration check and data forms until completion of a group of measurements.

2. There are two tape extensometer calibration frames located at the WIPP site. Both are suitable for use when performing calibration checks. Calibration frame, SNL - 2081, is located underground. It has eight anchor points labeled A through H. Calibration frame DOE 001, is located on the surface. It has four anchor points labeled A through D.

3. Inspect the calibration frame selected before each use. If there is any mechanical damage, the frame can not be used and the SNL Calibration Task Leader shall be contacted.

4. Record the Serial Number of the frame used, the manufacturer of the tape extensometer to be calibration checked and it's serial number. Each frame should have a thermometer attached to the frame. This temperature should be recorded on form 48.

5. Each measurement made must be done with the tape extensometer taken completely down and set up new. Measure and record all applicable pairs (dependent on frame being used): A to B, A to C, A to D, A to E, A to F, A to G, and A to H four times each.

B. Calibration Check Process

1. Attach instrument to first reference point eyebolt.

2. Un-reel tape to second reference point and attach snap-hook to the reference point eyebolt.

3. Reel up tape slack and engage tape locking pin in nearest punched tape hole.

4. Holding the tape extensometer in one hand, turn the knurled adjusting nut clockwise until the scribed lines on the instrument are aligned. At this point the tension force on the tape is at the correct value for reading. If the incorrect hole in the tape has been chosen such that a reading can not be obtained on the dial caliper, turn the knurled nut to lengthen the instrument so that the next hole in the tape can be used. Re-set the tension force.

5. Read the footage and inches first and record these values.

6. Read the Vernier scale and dial caliper gage and record this value on the correct form.

7. Repeat this process three more times and record the values.

C. Acceptance Criteria

1. There must be a repeatability among the four measurements for each pair with an error not to exceed 0.005 of an inch. Check that there is not any error in a group greater than 0.005 of an inch. Calculate the mean and record that value on the form also.

2. An instrument that does not meet the acceptance criteria will be tagged at that time and brought to the surface for repair. SNL QA will be notified and the calibration form no. 48 will be given to QA immediately.

II. Extension Rod Calibration Check (form 185)

A. INTRODUCTION

1. Several different length extension rods are available for use with the tape extensometer. They enable the technician to reach over head points without a ladder and make the measurement procedure safer, faster and more convenient.

2. The accuracy of the extension rod is heavily influenced by the treatment of the rod. It is important that the rod length be measured periodically. If the extension rod is suspected of damage it should be measured immediately before any more readings are taken.

3. Extension rods are to be calibrated (measured) before starting a set of measurements, when repaired or whenever they are suspected of damage. Normally the calibration check will occur prior to starting a group of measurements (which may require more than one shift to complete). If the measurements are not continued during the next working shift, the calibration check must be repeated. The PI or PI designee will provide direction if additional calibration checks (before and after measurements or once per shift, etc.) are required.

   NOTE: Retain all calibration check and data forms until completion of the group of measurements.

B. Calibration Check Process

1. The closure points to be used for calibration of the extension rod, should be picked close to the rib allowing for the use of the extension ladders. The closure points should be free of any obstructions such as boxes, cables, etc. that would interfere with the calibration operation.

2. Holding the rod firmly, hook the opened eyebolt end of the extension rod on the closure point in the back. Then attach the tape end snap-hook of the tape extensometer to the closure point in the floor. Hook the instrument end of the tape extensometer to the closed eyebolt end of the extension rod.

3. With the instruments hooked up in the position mentioned above, adjust the tape extensometer to the proper tension and read the measurement and record on form 185. Release the tension of the tape extensometer and readjust. Follow this procedure three more times and record each reading on form no. 185.

   NOTE: If necessary, refer to steps I. B. 3. through I. B. 6. for extensometer tensioning and reading details.

4. Remove the tape extensometer from the extension rod. Remove the extension rod from the closure point in the back and set the extension rod aside. Now hook the tape extensometer to the closure point in the back and adjust the tape extensometer to its proper tension, read the measurement and record. Then release the tension of the tape extensometer and readjust. Follow this procedure three more times and record each reading.

5. Average each set of readings, readings with the extension rod and readings without the extension rod. Subtract the two average values. This will give the average extension rod length. Record this value as the value used to make readings. Complete form no. 185.

III. Extensometer and Extension Rod Usage (form 35 for Mining Sequence Closure Gages; form 31 for all other closure gage types)

NOTE:
The tape extensometer can be used alone or with an extension rod that has been calibration checked.

A. Tape extensometer measurement without an extension rod.

NOTE:
To eliminate adding the weight of the instrument to the tape tension, always connect the instrument hook to upper closure point.

1. Hook the tape snap over one anchor point.

2. Unreel the steel tape in the direction of the other anchor point in the pair. Hook the instrument on to this opposite anchor point.

3. Reel up tape slack and engage tape locking pin in nearest punched tape hole.

4. Holding the tape extensometer in one hand, turn the knurled adjusting nut clockwise until the scribed lines on the instrument are aligned. At this point the tension force on the tape is at the correct value for reading. If the incorrect hole in the tape has been chosen such that a reading can not be obtained on the dial caliper, turn the knurled nut to lengthen the instrument so that the next hole in the tape can be used. Re-set the tension force.

5. Read the footage and inches first and record these values.

6. Read the Vernier scale and dial caliper gage and record this value on the form.

7. Repeat the process until two sequential readings agree within 0.008". If this criteria is not met, the process must be repeated with a different tape extensometer. Complete the rest of the form.

B. Tape extensometer measurements with an extension rod (vertical points, only!).

NOTE: The PI or PI designee may request deletion of extension rod use, to enhance accuracy of readings.

1. Hook the opened eyebolt end of the extension rod to the closure point in the back.

2. Attach the tape end snap-hook of the extensometer to the closure point in the floor.

3. Hook the instrument end of the extensometer to the closed eyebolt end of the extension rod.

4. Tension and read the tape extensometer as in the preceding section by following steps III. A. 3. through III. A. 7.

C. Frequency of Measurements.

1. The initial measurement will be recorded at the time of gage installation.

2. Subsequent readings shall be recorded at the interval specified by the PI or PI's designee on form(s) 43.

D. Data forms routing.

1. Completed data forms shall be routed to the PI or PI designee for technical review and approval.

2. The PI or PI designee will route the approved original form(s) to the SNL QA department.

REVISION SUMMARY

To be completed by procedure's author before final revision is circulated for signatures.

I. Revisions made: Incorporated redlined changes; expanded safety references; changed calib frame serial no. reference and deleted locations (I.A.2.); clarified calibration check frequency requirements (I.A.1. and 3., II.A.3.)

II. Personnel effected:
(Check appropriate ones)

MOC Craftsman		SNL JOB AREAS	
Drilling	____	DAS General	____
Shop	____	DAS B49 Trailer	____
Mechanical	____	DAS Sheds	____
Electrical	____	DAS Equip. Cal. & Inv.	____
Gage	X	Thermocouple	____
Cable/TC	____	Cables	____
U/G DAS	____	Drilling	____
Geotech	X	Gage Installation	X
		Gage Cal. & Removal	____
		Plugging & Sealing	____
		Brine Transport	____
		General	____

III. Retraining required:
(Circle one)

Read (Re-read procedure)

Practical demonstration

Other (explain)

Signature of Procedure's Author Wesley DeYonge Date 4/9/92